S/194/61/000/007/021/079 D201/D305

16,9000 (1031,1250,1329)

Arkhangel'skaya, A.A., Lazarev, V.G., Roginskiy, V.N.

and Sergeyeva, O.F. AUTHORS:

A computer for synthesizing relay-switching systems

Referativnyy zhurnal. Avtomatika i radioelektronika, TITLE:

no. 7, 1961, 51-52, abstract 7 V383 (V sb. Probl. peredachi inform., no. 6, M., AN SSSR, 1960, 5-23) PERIODICAL:

Principles are described of the design of a computer for synthesizing relay systems as designed at the Laboratory of Information Transmission Systems of the AS USSR. The conditions which the synthesizing computer should satisfy are set at a switch panel in the form of inputs and outputs. The circuit diagram of the panel is set to took whether the size of the panel. is set to test whether the given conditions can be realized and when it shows that these conditions cannot be realized, it determines the minimum number of relays which have to be used for these conditions to be realized. After this, various variants of the circuits are

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A computer for synthesizing...

S/194/61/000/007/021/079

designed and the computer chooses the one which has the minimum number of switches or in which the given distribution of relay switches has been obtained. The device design is based on the graphical method of synthesizing switching multiple-pole networks.

The final circuit is shown on a lamp register. 10 references.

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S/194/61/000/007/023/079 D201/D305

16,9000

Lazarev, V.G.

AUTHOR: TITLE:

Mechanization of the process of determining the

minimum number of intermediate relays

PERIODICAL:

Referativnyy zhurnal. Avtomatika i radioelektronika, no. 7, 1961, 52, abstract 7 V387 (V sb. Probl. pere-úachi inform., no. 6, M., AN SSSR, 1960, 24-33)

TEXT: The algorithm is analyzed of the process of choosing the minimum required number of intermediate functional elements (relays, keys, etc.) with the help of which it is possible to realise the given conditions. It consists of a consecutive reading of cadences of the manipulation chart with simultaneous checking whether the realization conditions are satisfied or not. If they are not, a new condition of intermediate relays is introduced. Two variants of algorithm are given together with the examples design of the chart which is being realized. The developed algorithm is used as

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Mechanization of the process... S/194/61/000/007/023/079

the basis of the corresponding bloc in the computer for synthesizing relay circuits as developed at the information transmission systems Complete translation systems. Abstracter's note:

LAZAREY V.G.

PHASE I BOOK EXPLOITATION

SOV/5741

Akademiya nauk SSSR. Laboratoriya sistem peredachi informatsii.

Problemy peredachi informatsii. vyp. 8: Postroyeniye skhem releynogo deystviya (Problems of Information Transfer. v. 8: Designing of Relay Circuits) Moscow, Izd-vo AN SSSR, 1961. 131 p. Errata printed on the inside of back cover. 2,600 copies printed.

Resp. Ed.: V. N. Roginskiy; Deputy Resp. Ed.: V. G. Solomonov; Tech. Ed.; L. V. Yepifanova.

FURPOSE: This collection of articles is intended for scientific and technical personnel concerned with the transfer of information.

COVERAGE: The book contains eight reports on the designing of relay systems. The reports were submitted by scientific workers of the Laboratoriya sistem peredachi informatsii Akademii nauk SSSR (Laboratory of Information Transfer Systems, AS USSR) to the seminar of the laboratory.

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Problems of Information Transfer (Cont.)	50 V /5741
TABLE OF CONTENTS:	
Foreword	3
Lazarev, V. G., C. A. Oganov, and V. N. Roginskiy. Fundament in Designing a Contactless Computer for the Synthesis of Rela	tals
Switching Circuits The basic principles in designing individual contactles units of a special-purpose high-speed computer used for the synthesis of relay switching circuits are presented Submitted 12/26/1959.	5 88 5
rkhangel'skaya, A. A., V. G. Lazarev, and Ch'en Chun-liang.	
In the graphic designing of (1,k)-terminal switching circuits the number of contacts in individual relay is evaluated. The complexity problem in the realization of Boolean functions by switching circuits is reviewed. The upper bound of the number of contacts for relays of a universal (1,k)-terminal network	20
realizing all the set-ups of k Boolean functions of	

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of n variables is discussed; the upper and lower bounds of the number of contacts for the relays of a pseudo-universal (1,k)-terminal network which does not realize all the set-ups of k Boolean functions of n variables are obtained. Methods for determining the "capacity" of a computer for the synthesis of switching circuits are proposed on the basis of upper and lower bounds of the number of contacts in the relays of an (1,k)-terminal network. Submitted 5/17/1960.

Ch'en Chun-liang. Concerning the Evaluation of Switching-Circuit Complexity

Propositions presented in the preceding article are developed. The problem of evaluating the complexity of switching (1,k)-terminal networks when the graphic method is used in designing circuits, is examined. Formulas for calculating fractions of the set-ups (i.e., the ratio of the number of occurrences of specific functions to the total number of the occurrences of functions) of k Boolean functions of Card 3/7

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n variables are derived for the case when they are realized by a given number of branches and contacts in a single cross section, as well as by a definite number of contacts in the circuit as a whole. In the second instance the fact that the occurrence of Boolean functions on the cross section is not of equal probability is taken into account. Submitted 4/16/1960.

Roginskiy, V. N. Graphic Designing of Switching Circuits With Bypass Paths

General methods are presented for the transformation of set-up numbers for a graphic synthesis of multi-terminal switching networks, taking into account bypass paths which are formed in connection with the construction of direct deductions. A method is given for clarifying different variants arising from the nonsinglevaluedness of the set-ups during the construction of direct deductions. Submitted 2/17/1960.

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Ch'en Chan-liang. Concerning the Distribution of Probabilities of Cocurrence of Boolean Functions

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The article discusses the problem of variation in probability distribution of the occurrence of Boolean functions passing from one cross section to another in the presence of direct deductions when the switching circuits are designed by the graphic or symbolic method. Formulas are derived for calculating the probability of occurrence of Boolean functions in various cross sections, provided the probability distribution of their appearance on zero cross section is known. Submitted 3/12/1960.

Sagalovich, Yu. L. The Measure of Ordering of a Boolean Function On the basis of the results of writing switching circuits in the form of Boolean functions, the value k is introduced as a minimum number of set-ups of variable values sufficient for identifying a Boolean function.

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897/5741

Methods of calculating this value which utilize the properties of various classes of Boolean functions, as well as methods of evaluating it, are given. The method of designing the inertia group of a Boolean function is completed, and a scheme is designed which permits a) carrying out group transformations of Boolean functions; b) constructing equivalent (in the sense of noiseproofness) uniform codes. Submitted 6/26/1959.

Lazarev, V. G., and C. A. Oganov. Graphe-Analytical Method of the Synthesis of Contactless Relay Circuits

The method of plotting a block-diagram with parametric relationships of a logical (1,k)-terminal network which realizes Boolean functions using logical gates AND, CR, and NOT, is studied.

Submitted 2/17/1960.

109

Maystrova, T. L., and V. N. Roginskiy. Relay Circuits With Parametric Relationships and Many-Valued Logic Operating conditions of a relay in a circuit with parametric relationships are examined. It is

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demonstrated that the proposed apparatus of many-valued logic may serve for describing the operation and equivalent transformations of such circuits. Submitted 2/5/1960

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Card 7/7

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33508 \$/562/61/000/009/008/012 D201/D302

16.6800 (1024, 1399, 2403)
AUTHOR: Lazarev, V. G.

TITLE:

Synthesis of "OR-AND" contactless relay switching cir-

SOURCE:

Akademiya nauk SSSR. Laboratoriya sistem peredachi informatsii. Problemy peredachi informatsii. No. 9,1961.

Elementy sistem avtomatiki, 144-149

TEXT: The author shows that the method of synthesizing contactless switching circuits as developed for the sake of simplifying (Boolean) functions denoted in disjunctive normal form, owing to the duality of the disjunctive and conjunctive normal forms, may be generalized over to the Boolean functions written in a conjunctive generalized over to the boolean functions will ten in a conjunctive normal form. To do so, the idea of "pseudo-numbers" is introduced which are taken as the digital equivalent of the null decomposition which are taken as the digital equivalent of the null decomposition constituent, obtained according to the following rule: Every variable has its attributed "weight" 21-1, where i is the consecutive ble has its attributed "weight" 21-1 attributed promise from a number of the variable. To go over to a fully conjunctive from a

Card 1/2

Synthesis of "OR-AND" ...

S/562/61/000/009/008/0:2 D201/D302

fully disjunctive normal form it is necessary to set-up a function from constituents not belonging to the given fully disjunctive function and to invert it. It follows that in order to go over to pseudo-numbers the following procedure has to be used: The given assembly of numbers is first inverted and then all assembly numbers are replaced by pseudo-numbers so that the sum of the number \mathbb{I}_1 and of the pseudo-number \mathbb{I}_1 be equal to $\mathbb{I}_1+\mathbb{I}_1=2^{n-1}$. The method of contactless switching system design of type OR-AND is thus analogous to that of type AND-OR, in which all operators AND are substituted by OR and vice versa. Numerical examples show that depending on conditions either types AND-OR or OR-AND circuits may be simpler and for an optimum solution of the circuits both variants are required. There are 3 figures and 6 Soviet-bloc references.

SUBMITTED: August 5, 1960

Card 2/2

S/194/62/000/007/057/160 D295/D308

AUTHORS:

Lazarev, V.G., and Oganov, O.A.

TITLE:

An analytical method of the synthesis of contactless

relay circuits by means of graphs

PERIODICAL:

Referativnyy zhurnal. Avtomatika i radioelektronika, no. 7, 1962, abstract 7-2-149 m (In collection: Probl. peredachi informatsii, no. 8, M., AN SSSR, 1961,

109 - 120)

TEXT: A method is given for designing single-cycle relay systems consisting of contactless AND, OR and NOT functional blocks. The design process is carried out by proceeding from the circuit outputs to which Boolean functions with obligatory and conditional terms are attributed. The transformation of such functions, when the AND, are and NOT operators (blocks) are used, is shown. By writing the conditions in normal disjunctive form, simplification (minimization) conditions in normal disjunctive form, simplification (minimization) of the notation is obtained, after which coinciding functions emerge. The outputs with coinciding functions are unified, and the unified function is attributed to them. It is convenient in certain fied function is attributed to them. It is convenient in certain

S/194/62/000/007/057/160 D295/D308

An analytical method of the ...

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cases to introduce the NOT operator if one of the function is found to coincide with another after inverting. At each of the points that remain after carrying out the unifying procedure the output of an OR functional block (operator) is drawn, with a number of inputs equal to the number of terms in the function. One attributes to each input the corresponding new function, or several functions in the presence of multivaluedness determined by conditional terms. Unifying possibilities are again ascertained, and the AND operator, and then the NOT operator, are introduced. The structure of a three—seven—terminal network which realizes 7 functions of three variables is shown in the figure. Additional operations that sometimes enable the circuit to be simplified are cited, and the possibility of introducing the operators in a different order is indicated.

16 references. [Abstracter's note: Complete translation.]

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9,7/60

16,6800 (2403 1327,1329)

32588 \$/569/61/003/000/007/011 D201/D305

AUTHORS:

Lazarev, V.G., and Parkhomenko, P.P. (USSR)

TITLE:

Mechanization of analysis processes and of the struc-

ture synthesis of switching circuits

SOURCE:

International Federation of Automatic Control. 1st Congress, Moscow, 1960. Statisticheskiye metody issledovaniya. Teoriya struktur, modelirovaniye, terminologiya, obrazovaniye. Moscow, IZd-vo AN SSSR, 1961,

357 - 367

TEXT: The authors present certain results of research on the mechanization of the processes of analysis and of synthesis of switching circuits as obtained at the Institut avtomatiki i telemekhaniki AN SSSR - IAT (Institute of Automation and Telemechanics, AS USSR) and at the Laboratoriya sistem peredachi informatsii AN SSSR - LSPI (Laboratory of Information Transmitting Systems, AS USSR). The machine for analysis of relay switching circuits was developed in 1957 at IAT by P.P. Parkhomenko, under the leadership of Professor M.A. Gavrilov. The first model of the machine for the synthesis of Card 1/5/

S/569/61/003/000/007/011 D201/D305

Mechanization of analysis processes ...

switching circuits, consisting of four relays with two output circuits each, was developed in 1956 at the LSPI by a group consisting of V.G. Lazarev, A.A. Arkhangelskaya and S.S. Kraynov under the leadership of V.N. Roginskiy. The second perfected model was developed in 1957-1959 at LSPI by A.A. Arkhangelskaya, O.F. Sergeyeva loped in 1957-1959 at LSPI by A.A. and S.S. Kraynov under the leadership of V.N. Roginskiy and V.G. Lazarev. The circuit analysis of a system consists in determining states of operating components, including their interdependence in time. In practice, this reduces to checking the circuit structure and determining the sequential operation of multi-contact circuits in time. Determination of sequential time operation of components of a multi-contact circuit may be made from the results of structural analysis of its single-contact equivalent. The bloc diagram of the machine designed using this principle is shown in Fig. 2, where B - external disturbance unit, determining the initial state of input components and changes of states of reacting components occurring in the steady-states of the circuit; 3-delay unit, used for simulating delays in operation and release of the circuit components; 0 - feedback unit for transmitting from the output to the input the intermediate component state combinations. Card 2/5/

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Mechanization of analysis processes ...

 $\begin{array}{l} 1 \\ \text{BF}(Y_B(t) \rightarrow \text{output, } M)M(Y_B(t) \sim Y_M(t)) \end{array} \stackrel{2}{\downarrow} \Gamma(Y_M(t) \rightarrow 3) \end{array}$

is the logic of the algorithm realized by the machine, for obtaining the table of commutations of a multi-contact switching system. The synthesis of a relay switching arrangement is actually the design of the switching part of the circuit together with, for a multi-contact system, choosing the intermediate relays and their seti-contact system, choosing the intermediate relays and their seti-contact system, choosing the intermediate relays and their setimates of switching management. quence of switching. The design of such a machine was made possible by the graphical method of obtaining the required synthesis algorithm the graphical method of obtaining the required synthesis algorithm. thm given by V.N. Roginskiy (Ref. 10: Graficheskiy metod postroeniya skhem kontaktnych (1, k) - polyusnikov (Graphical Method of (1, k)-Pole Switching Network Design). Problems peredachi informataii ya sknem kontaktnych (1, k) - polyusnikov (Graphical Method of (1, k)-Pole Switching Network Design). Problemy peredachi informatsii, Izd-vo AN SSSR, 1959). This graphical method lies at the basis of design of the fully automatic machine for synthesis of relay averages. design of the fully automatic machine for synthesis of relay systems. From the conditions of connections between the input and each of two outputs, the machine makes it possible to construct a switching system of two operating circuits, consisting from the contacts of not more than A relays who synthesis conditions are supported to the contacts of not more than A relays who synthesis conditions are supported to the contacts of not more than A relays tacts of not more than 4 relays. The synthesis conditions are supplied as a set of numbers of of numb lied as a set of numbers on a special board. The results of synthe-Card 3/5/

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Mechanization of analysis processes ... S/569/61/003/000/007/011

sis are displayed on a light grid. The machine has 204 relays type PKH (RKN), The synthesis time of one variant is about 1 mm. The second model of the machine produces not only the synthesis of the switching system but also the process of checking whether the commu tation table can be realized or not, the process of choosing the minimum necessary number of intermediate relays and the process of constructing the commutation table itself. The machine incorporates a counter, automatically consisting of the number of contacts of each relay and the overall number of contacts. There is a safety device included, protecting the machine against the operator's mistake. The second machine has about 1000 relays type RKN and five type WM-11 (ShI-11) and WM-25 (ShI-25) selectors. The design of a machine for the synthesis of systems with a larger number of relays (9 - 10) is limited by the operating speed and dimensions of the machine. These are the reasons why the electronic variant of the machine is under devlopment at LSPI. A discussion followed in which the following took part: Shcheglovitov (USSR), R.K. Belikov (USSR), B. L. Timofeyev (USSR) and V.D. Kazakov (USSR). There are 5 figures and 13 references: 11 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows:

16,6800

25125 S/103/61/022/009/006/014 D206/D304

AUTHORS:

Lazarev, V.G., and Piyl', Ye.I. (Moscow)

· TITLE:

A method of synthesizing switching circuits

PERIODICAL: Avtomatika i telemekhanika, v. 22, no. 9, 1961, 1194 - 1201

TEXT: In the present article, the elements of feedback (\ni 0C-EOS) are considered which produce at the output voltage signals. Conditions when they have to be used are analyzed and their minimum number evaluated for a given set of conditions, and finally a method of synthesizing switching circuits is proposed for the case when feedback elements are used which react to the signals resulting from any transition of the combination of input into any of the output (\ni 0C- \ni -EOS- \ni 8) feedback elements of \ni 8 type. In this case the feedback elements can be switched in independently of their previous state by signals resulting from a transposition of signals not met before. Let the switching be given by Fig. 1a with

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A method of synthesizing ... D206/D304

S/103/61/022/009/006/014 D206/D304

the following notation: x_i - input signals; z_i - output signals; - - signal present at main input; - signal present at the subsidiary input x at the output. Since the output signals result from transitions of certain input conditions into other signals, a definition of these transitions is needed. They are described by voltagepulse formulae introduced by A.D. Talantsev (Ref. 6: Ob analize i sinteze nekotorykh elektricheskikh skinem pri pomoshchi spetsiyal nykh logicheskikh operatorov (Analysis and Synthesis of Certain Electric Circuits by Special Logic Operators), Avtomatika i telemekhanika, v. XX, No. 7, 1959) which include 'and' 'or' 'nor' and d transformation circuits. Transitions exist from the 'on' state of input signal into 'zero' and vice versa: d x(t) = 1 - transition from 'one' to 'zero' state, dx(t) = 1 - from zero to one when dx(t) = 0 and dx(t) = 0 - no transition exists. The signals from main outputs have a voltage character and are described by

 $z_{1} = \overline{x_{1}} x_{2} x_{3} \overline{x_{4}} x_{5} \bigvee \overline{x_{1}} x_{2} x_{3} x_{4} \overline{x_{5}} \bigvee \overline{x_{1}} \overline{x_{2}} x_{3} x_{4} \overline{x_{5}} \bigvee \overline{x_{1}} \overline{x_{2}} x_{3} x_{4} \overline{x_{5}} \bigvee \overline{x_{1}} \overline{x_{2}} \overline{x_{3}} \overline{x_{4}} \overline{x_{5}} \bigvee \overline{x_{1}} \overline{x_{2}} \overline{x_{2}} \overline{x_{3}} \overline{x_{4}} \overline{x_{5}} \bigvee \overline{x_{1}} \overline{x_{2}} \overline{x_$

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A method of synthesizing ...

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(parameter t being omitted). The signals for switching the EOS-B circuits may be described by boolean functions if function F is found such that y = dF, i.e. if a voltage function F exists, whose comes that shown in Fig. 3 in which all signals. The circuit besignals. The process of determining function F is called the integrating of a voltage pulse from y (Ref. 6: Op.cit.). Function F can be obtained directly from operating conditions of the circuit.

$$\mathbf{F}_{3} = \mathbf{x}_{1} \bar{\mathbf{x}}_{2} \bar{\mathbf{x}}_{3} \bar{\mathbf{x}}_{4} \bar{\mathbf{x}}_{5} \vee \mathbf{x}_{1} \mathbf{x}_{2} \mathbf{x}_{3} \mathbf{x}_{4} \bar{\mathbf{x}}_{5}$$

Its values may thus be produced in the same form as main output signals z and the switching circuit may be designed by the known methods around 'and' 'or' and 'nor' elements. The design procedure in using EOS=B elements is thus as follows: 1) Additional inputs are connected, required for realizing the given conditions of operation; 2) By weighing input signals the absolutely necessary and

A method of synthesizing ...

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conditional number selections of output signals 2 are obtained;
3) This determines the absolutely necessary numbers for function
F. In general two forms of function F may be obtained; 4) Therefore each form of F both F and 2 functions are simplified using the conditional numbers, and the circuit is built using and or or nor elements. It is stated in conclusion that the circuit as shown in Fig. 3 is not always possible to realize since for some voltage-pulse forms, not one but many F functions can be found, whose differential is y. There are 7 figures, and 15 references:
13 Soviet-bloc and 2 non-Soviet-bloc. The references to the English-language publications read as follows: W. Keister, A.E.
Ritchie, S.W. Waschburn, The design of switching circuits, N.Y.
Van Nostrand, 1951; D.A. Huffman, The synthesis of sequential switching circuits. Journal of the Franklin Inst., v. 257. no. 3,

SUBMITTED: February 14, 1961

Card 4/5

9,4000 (1159,1139,1161)

25707 \$/020/61/139/003/006/025 B104/B201

AUTHORS:

Lazarev, V. G., and Piyl', Ye. I.

TITLE:

Integrating of potential-pulse shapes

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 139, no. 3, 1961, 556 - 559

TEXT: A description is offered of algebraic methods of integrating potential-pulse shapes, which permit the circuit diagram of the electronic devices concerned to be simplified appreciably. The potential-pulse shapes can be represented as disjunction g of conjunctions of the form

 $\beta_{i} = x_{i_{1}}^{p_{i_{1}}} x_{i_{2}}^{p_{i_{2}}} \dots x_{i_{n-1}-1}^{p_{i_{n}-1}} dx_{i_{n}}^{p_{i_{n}}}, \qquad Y = \bigvee_{i=1}^{g} \beta_{i}$ (1).

Here, $p_i = 0$, 1; $x_i = x_i p_i \sqrt{x_i} \overline{p_i}$; $g \le n2^n$. These conjunctions are designated as unconditional if Y = 1 is satisfied. If Y = 0 they are called forbidden conjunctions. Such for which Y is undefined are designated as conditional conjunctions. Taking account of the latter enables one to simplify the electronics in a number of cases. The Card 1/4

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integration method described here proves the most effective in cases, where a large number of conditional conjunctions appear. A potential-pulse shape is said to be integrable if it is possible to indicate a Boolean function $F(x_1, ...x_n)$ such that dF = Y(2). F, like any Boolean function, can

be defined by a great number of constituents, by which F assumes the value 1. They are called unconditional constituents. Such as assign F the value O are termed forbidden constituents, and such in which F is not defined are designated as conditional constituents. Conjunction

 $c_4^{p_{in}}$ is an unconditional constituent of function F, and x_{i_r} x_{i_n} is a forbidden conjunction. conjunction di = xi

Both constituents are designated as a pair of constituents and denoted by

Each of the conjunctions of an integrable potential-pulse Card 2/

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Integrating of ...

shape defines a pair of constituents for the function F. The potential-pulse shape is defined as a system of constituent pairs, which is denoted by $[Y] = [A_{i_1}, \dots, A_{i_l}]$. The totality of forbidden conjunctions defines

a system of sets of constituents, which may be represented in the form $|Y| = |B_{j_1}|, \dots, B_{j_s}|$. The system $\{Y\} = \{A_{i_1}, \dots, A_{i_n}, B_{j_1}, \dots, B_{j_h}\}$

is defined as a general system of pairs and sets. If, in this general system, one of the unconditional constituents does not appear among the forbidden ones, this system is said to be coordinate. Otherwise, this general system can be divided into coordinate subsystems, and the general system will be partially coordinate. To each of these subsystems there corresponds a function $\mathbf{F}^{\mathbf{j}}$. A potential-pulse shape (1) is designated as

being partially integrable if $\bigvee_{j=1}^{m} dF^{j} = Y(3)$. If no function F can be

found to satisfy (2) or (3), this potential-pulse shape will be not integrable. The following theorems are formulated: Theorem 1: A potential-pulse shape is integrable if a coordinate general system of Card 3/4

25707 S/020/61/139/003/006/025 B104/B201

Integrating of ...

pairs and sets of constituents corresponds to it. Theorem 2: A potential-pulse shape is partially integrable if a partially coordinate general system of pairs and sets of constituents corresponds to it. Theorem 3: A potential-pulse shape is not integrable if an absolutely noncoordinate general system of pairs and sets of constituents corresponds to it. Two examples are finally discussed. It is assumed in them that, if no forbidden conjunctions appear, all the others are conditional conjunctions, with the exception of those defining the potential-pulse shape. In this case there is no system of sets of constituents, and the general system of pairs and sets will agree with the system of pairs of constituents. A. D. Talantsev is mentioned. M. L. Tsetlin is thanked for interest displayed and advice given. There are 3 Soviet-bloc references.

PRESENTED: February 23, 1961, by B. N. Petrov, Academician

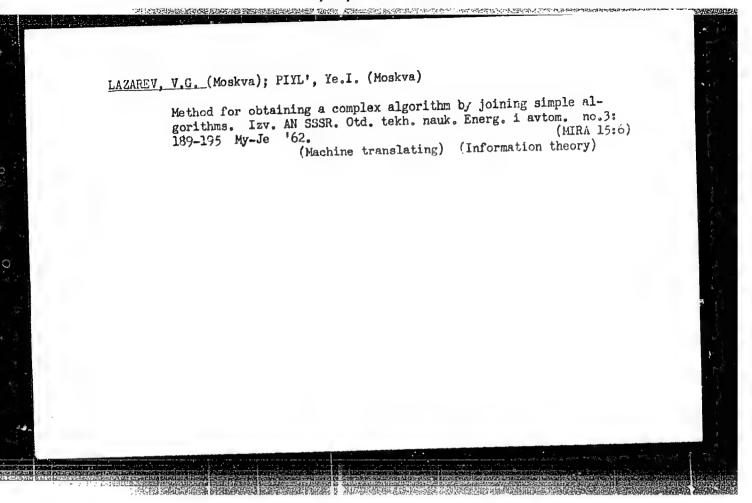
SUBMITTED: February 22, 1961

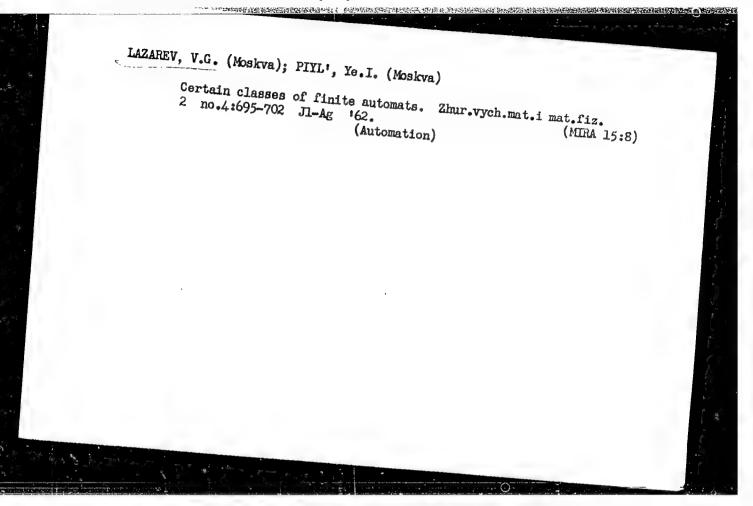
Card 4/4

LAZAREV, V. G. and PIYL, Ye. I.

"Reduction of member of internal states in certain classes of finite automata"

report submitted for the Intl. Symposium on Relay Systems and Finite Automata Theory
(IFAC), Moscow, 24 Sep-2 Oct 1962.





40133 S/103/62/023/008/002/006 D409/D301 Lazarev, V.G. and Piyl', Ye.I. (Moscow) Method of synthesis of finite automata (sequential circuits) with pulse-potential feedback elements AUTHORS: Avtomatika i telemekhanika, v. 23, no. 8, 1962, TITLE: 1037 - 1043 FERIODICAL: A method of synthesis of sequential circuits is proposed, based on Huffman's transition tables and the use of pulsepotential feedback elements; the latter is described in an earlier work by the authors. The number of rows of Huffman's tables is further reduced and a tabular method of integrating the pulse-potential forms is considered. The proposed method of synthesis of sequential circuits involves the following steps: 1) The transition tables are contracted by Huffman's method: 2) The tables are further contracted by using rulse-rotential feedback elements, i.e. all the unstable states are replaced by stable states (by introducing new notations in the tables); thereby groups of similar stable states appear in the table. From each Card 1/3

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Method of synthesis of finite ...

of the groups it is possible to eliminate some of the states; the new sequential circuit obtained is equivalent to the original sequential circuit: 3) Each row of the contracted table is made to correspond to a certain combination of states of the feedback elements: 4) The Boolean functions for the output signals, determining the output states. are written down: 5) The pulse-potential form for each additional output signal is written down (these forms can be directly obtained from the tables): 6) The pulse-potential forms are integrated, i.e. a Boolean function F is sought, so that y = dF.

or, in the case of $\, m \,$ Boolean functions $F^{\hat{J}}$:

$$Y = \bigvee_{j=1}^{m} dF^{j} . \tag{2}$$

Each of the conjunctions of Y determines a pair of components of F corresponding to 0 and 1, respectively). The system of components of F. for which the latter assumes one and the same value, is called the system

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36908 \$/020/62/143/005/004/018 B104/B102

AUTHORS:

Lazarev, V. G., and Piyl', Ye. I.

TITLE:

Reduction of the number of states of one class of finite

automatons

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 143, no. 5, 1962, 1064-1066

TEXT: Automatons described by

 $\chi(p+1) = \gamma \left\{ \tilde{a} \left[\mu(p-1) \right] \right\} = \gamma \left\{ \tilde{a} \left[\varrho(p-1); \chi(p-1) \right] \right\};$ $\lambda(p) = \Gamma \left[\varrho(p); \chi(p) \right]$

are investigated. $\chi(p)$ is the inner state of the automaton, $\lambda(p)$ is the cutput state, $\varrho(p)$ is the input state, p is the time interval corresponding to the period T of an automaton cycle, d is a transition operator describing the variation in state of the automaton, d[j!(p-1)] denotes the variation in state of the automaton during its transition from cycle p-1 to cycle p. The description of the operation of an asynchronous automaton by means of a transition matrix is studied (D. D. Aufenkamp,

Card (/2)

S/020/62/143/005/004/018 B104/B102

Reduction of the number of ...

F. E. Hohn, Trans. IRE, Prof. Group on EC, 6, no. 4 (1957)). The variable quantity T is determined by the input state. The period of transition from one state to another is assumed to be smaller than T. The transition matrix is reduced by D. D. Aufenkamp's method (Trans. IRE, Prof. Group on EC, 7, no. 4 (1958)). The new matrix describes an automaton which is equivalent to the original one, but has a minimum number of inner states.

ASSOCIATION: Institut problem peredachi informatsii Akademii nauk SSSR (Institute of Information Transmission Problems of the Academy of Sciences USSR)

PRESENTED: October 19, 1961, by B. N. Petrov, Academician

SUBMITTED: October 12, 1961

Card 2/2

EWT(d)/FCC(w)/BDS AFFIC IJP(C) L 11127-63 ACCESSION NR: AT3001255 AUTHOR: Lazarev, V. G.; Piyl', Ye. I. TITLE: Determination of the number of inner states for one class of finite automata SOURCE: AN SSSR. Inst. problem peredachi informatsii. Problemy* peredachi informatsii, no. 12, 1963, 39-52 TOPIC TAGS: synthesis of finite automata, minimal-state automata, minimization problem ABSTRACT: The synthesis of one class of finite automata, the behavior of which is described by the equations: $\lambda(p) = \Gamma \left[\kappa(p), \, \rho(p) \right],$ $\kappa(p+1) = \phi \{d[\mu(p-1)]\} = \phi \{d[\rho(p-1), \kappa(p-1)]\},$ (1) where $\kappa(p)$ is the inner state of the automaton, $\rho(p)$ is the input state, $\lambda(p)$ is the output state, p is the interval of time defined by the state of an automaton,

L 11127-63.... ACCESSION NR: AT3001255

and $d[\mu(p-1)]$ is an operator describing the change in the state of an automaton during passage from the interval p - 1 to the interval p, has been studied. It is noted that for the realization of such automata, feedback elements must be used which respond to the pulse signals formed by the transition of the automaton from one state into another (thyratrons, various triggers, etc.). It is shown that, in a series of cases, such automata can be realized with a smaller number of inner states than automata described by the equations:

 $\varkappa(p + 1) = \varphi(\varkappa(p), \rho(p)),$ $\lambda(p) = \Gamma\{(\kappa(p), \rho(p)\}$

under the same operating conditions. Methods for reducing the number of states of finite automata described by equations (1) are presented for cases in which operating conditions of automata are defined by 1) tables of switchings, 2) tables of transitions (Huffman tables), and 3) transition matrices. This article was reported in a seminar of the Institut problem peredachi informatsii Akademii nauk SSSR (Institute of the Problems of Information Transmission, Academy of Sciences, SSSR) 10 Dec 1960 and 10 Jun 1961. Orig. art. has: 3 figures, 5 formulas, and 3 tables.

s/2945/63/000/015/0005/0012

ACCESSION NR: AT4008640

AUTHOR: Lazarev, V. G.

TITLE: Development of control system for the information transmission and distribution networks

SOURCE: AN SSSR. Institut problem peredachi informatsii. Problemy* peredachi informatsii, no. 15, 1963. Sistemy* raspredeleniya informatsii. Opoznaniye obrazov, 5-12

TOPIC TAGS: information transmission, information distribution, communication network, transmission control system, distribution control system, connection control, telephony, call handling control, connection optimal control, computer controlled call, connection control programming, automatic control system, control algorithm, programmed information transmission

ABSTRACT: In order to ensure optimal service to the subscribers of

CIA-RDP86-00513R000928920007-4" APPROVED FOR RELEASE: 03/13/2001

an information transmission and distribution network (such as a telephone system, a system serviced by a computer, and others) under varying load conditions, several types of system control units are proposed, which analyze the existing situation (for example, by means of a special-purpose digital computer) and select the optimal system interconnections to cope with the situation. Two basic control units are considered, with decentralized and centralized functional interconnections. It is shown that with a centralized multiprogram control system it is possible to organize the control of a network for the transmission and distribution of information in a flexible manner in such a way that the communication channels, the switching equipment, and the control units themselves are used where necessary, and this optimizes the degree of utilization of the system equipment. Orig. art. has: 6 figures.

ASSOCIATION: Institut problem peredachi informatsii AN SSSR (Institute of Information Transmission Problems AN SSSR)

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s/2945/63/000/015/0023/0035

AUTHORS: Lazarev, V. G., Piyl', Ye. I.

TITLE: Methods for construction of a programmed control block in a control system

SOURCE: AN SSSR. Institut problem peredachi informatsii. Problemy* peredachi informatsii, no. 15, 1963. Sistemy* raspredeleniya informatsii. Opoznaniye obrazov, 23-35

TOPIC TAGS: programmed control block, control block construction, control system, block asynchronous operation, block synchronous operation, finite automatic system, functional block, algorithm logic circuit, Mealy automaton, Mur automaton, asynchronous operation mode, synchronous operation mode, coding control, sequential logic network

ABSTRACT: Methods are considered for the construction of a program

Cord 1/3

control block, which determines the sequence with which functional blocks of an information distribution system are to operate in order to service the incoming calls in accordance with a specified algorithm. The program control block issues control signals which initiate operation of the functional block. At the end of the operation, the functional block generates a signal fed back to the program control unit, following which the latter can issue the next control The Lyapunov algorithm logic circuit (Problemy kibernetiki, No. 1, Fizmatgiz, 1958) is used to describe the sequence of the program control block signals. The case of realization of a single algorithm and of several algorithms whose sequence depends on various parameters is considered in detail. Realization of the program control block by means of both Mealy and Moore automata is discussed. It is shown that synchronous and asynchronous operating modes of the programmed control block are approximately equivalent with respect to the number of elements necessary to synthesize the system. The asynchronous operating mode has the advantage that it permits more ef-

Card ___ 2/3

fective utilization of the operating speed of the control block, but may cause some complications in the functional blocks, owing to the need of generating signals that indicate the termination of their operation. Consequently, the choice of the program control block used for a specific automatic system depends primarily on the conused for a specific automatic system depends primarily on the control operating conditions of the control block. Orig. art. has: 5 figures, 16 formulas, and 8 tables.

ASSOCIATION: Institut problem peredachi informatsii AN SSSR (Institute of Information Transmission Problems AN SSSR)

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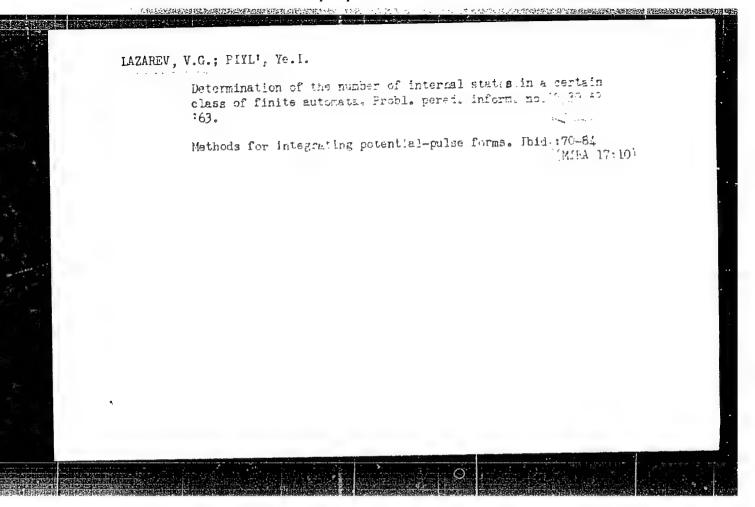
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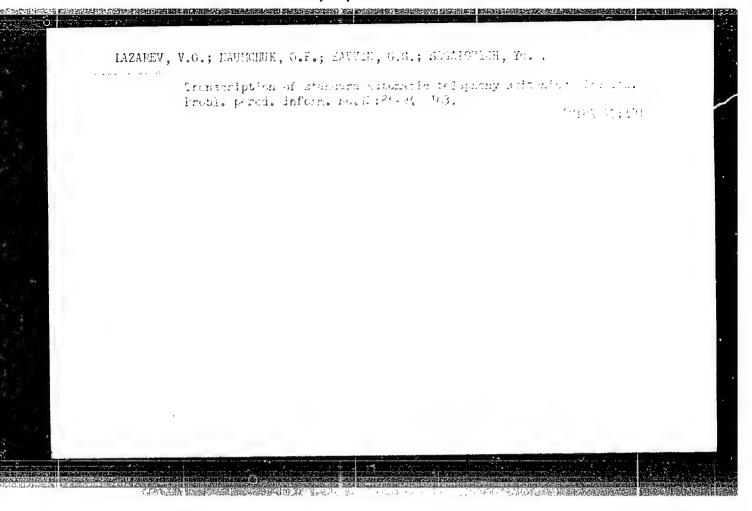
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Card 3/3





S/103/63/024/002/017/020() D201/D308

AUTHORS:

Lazareve V.G. and Piyl', Ye.I. (Moscow)

TITLE:

Simplification of pulse-potential forms

PERIODICAL:

Avtomatika i telemekhanika, v. 24, no. 2, 1963,

271-276

TEXT: The authors describe a simplification of pulse potential forms by separating common factors from adjacent homogeneous conjunctions. The simplification is carried out in two stages: in the first stage the simplifications are based on the use of absolutely homogeneous conjunctions, leading to the elimination of variables and in the second stage they are related to introduce the D-operator.

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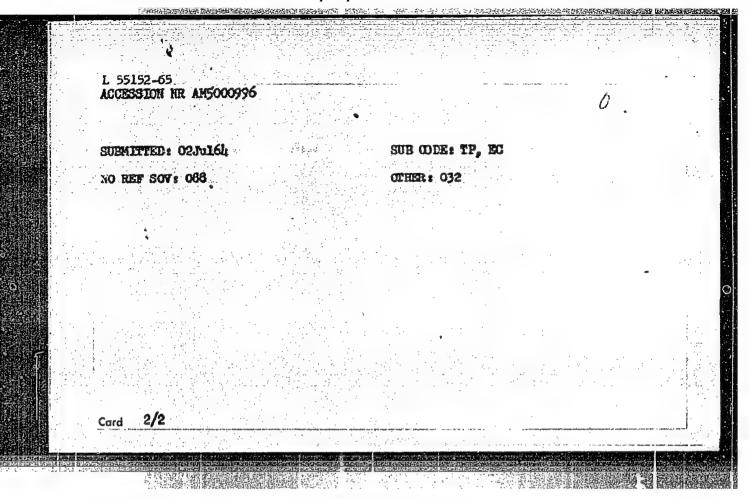
January 4, 1962

Card 1/1

IVANOVA, Ol'ga Nikolayevna; LAZAREV, Vladimir Georgiyevich;
PIYL', Yelena Ivanovna; MARKHAY, Ye.V., prof., stv. red.;
VOLKOVA, E.M., red.

[Synthesis of electronic circuits with discrete action]
Sintez elektronnykh skhem diskretnogo deistviia. Moskva,
Izd-vo "Sviaz'," 1964. 175 p. (MIRA 17:5)

L 55152-65 EWT(d)/EWT(1)/EWP(v)/EWP(k)/EWP(h)/EWA(h)/EWP(1) ACCESSION NR AM5000996 BOOK EXPLOITATION Lazarev, V. G.; Piyl', YE. I. Synthesis of asynchronous terminal automatic devices (Sintes sainkiromyich konechnykh avtomatov), Moscow, Izd-vo "Nauka", 1964, 258 p. illus., biblio. Errata slip inserted. 2,800 copies printed. (At head of title: Akademiya nauk SSSR. Institut problem peredachi informateii) TOPIC TAGS: circuit theory, sequence switch, relay system, sutomatic control canonic equation . logic circuit TABLE OF CONTENTS (abridged): Foreword - 3 Introduction - 5 Ch. I. Definition of the classes of finite automatic machines - 12 Ch. II. Minimization of the number of internal states of asynchronous finite automatic machines - 38 On. III. Obtaining canonic equations - 164 Ch. IV. Synthesis of a logic converter of an automatic machine -- 207 Bibliography - 252 Card



ACCESSION NR: AT4042437 S/0000/64/000/000/0059/006

AUTHOR: Zenchenko, V. P.; Lazarev, V. G.; Piyl', Ye. I.

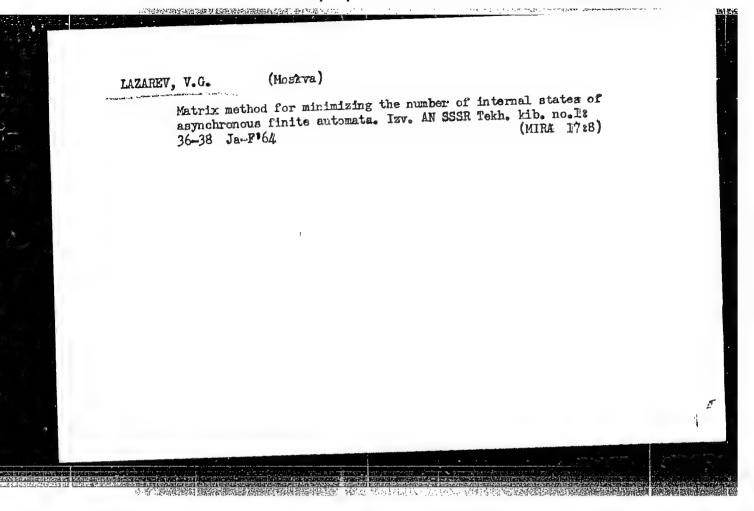
TITLE: Synthesis of pneumatic systems with track control using transition operations

SOURCE: Vsesoyuznoye soveshchaniye po pnevmo-gidravlicheskoy avtomatike. 5th, Leningrad, 1962. Pnevmo- i gidroavtomatika (Pneumatic and hydraulic control); materialyk soveshchaniya, Moscow, Izd-vo Nauka, 1964, 59-66

TOPIC TAGS: automation, automatic control system, pneumatic control system, track control, transition operation, cyclogram, control system design

ABSTRACT: In an earlier paper by the first author (V. P. Zenchenko. Strukturny metod postroyeniya pnevmaticheskikh sistem s putevy metod kontrolem. Stanki i instrument, 1962, No. 4), a method was proposed for the synthesis of prematic systems with track control based on devices which realized the operations AND, OR, NOT, and MEMORY, and which allowed one to obtain dynamically stable systems. In the present paper, the authors start with a discussion of the transition operations. The cyclograms of a machine for crimping covers and of a loading device are illustrated by way of example. They then show how to eliminate the coincidence of the stages and how to simplify the pulse-potential forms. Using the method

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L 28754-65 EHT(d)/EHT(1)/EHP(c)/EHA(d)/EHP(v)/I/EHP(k)/EHP(h)/EHP(1)/EHA(h)Pf-4/Peb ACCESSION NR: AT5003306 \$/2950/64/000/003/0063/0066 AUTHOR: Lazarev, V. G. TITLE: A machine for the synthesis of relay switching circuits SOURCE: EIKA, entskilopediya izmereniy, kontrolya i avtomatizatsii (Encyclopedia of measurement, control and automation), no. 3. Moscow, Izd-vo Energiya, 1964, 63-TOPIC TAGS: relay circuit, relay switching circuit, circuit design, relay system synthesis, switching circuit synthesis ABSTRACT: Because of the multiplicity of possible solutions in the synthesis of switching circuits it is very difficult to obtain an optimum configuration, i.e. one that has a minimum number of relays and switches. A machine approach to this problem is therefore desirable. The Institut problem peredachi informatsii AN SSSR (Institute of information transmis ion problems) first developed such a machine in 1956-1957. This machine could synthesize switching circuits with one input and k outputs and display any of the n; varieties of the circuit (n = number of relays) for 2k2n conditions on a visual display in schematic form. The Institut avtomatiki i telemekhaniki (Institute of automation and remote control) constructed

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ACCESSION NR: AT5003306

this type of machine for k = 2 in 1958. Its principle of operation was based on the graphical method of synthesis of switching circuits, described by V. N. Roginskiy (Probl. peredachi informatsii, 1, 1959, pp. 5-40). For k = 2 and n = 4 the machine contained 204 relays and required 1 minute to synthesize one version of the circuit. In 1957-1959, the Institute developed an improved version of this machine. The new model allowed an automatic verification of the circuit realizability and minimum number of relays required to obtain a realizable circuit from nonrealizable conditions. The processing algorithm for this machine was given by V. G. Lazarev (Sb. nauchn. rabot po provodn. svyazi, 5, 1956, pp. 93-103). The display could not accommodate all of the 22.2n conditions and only simpler versions could be synthesized. This caused the display dimensions to vary linearly with n instead of exponentially, as in the first model. In 1960, the Institute designed a completely electronic version of this machine. The new design permitted the synthesis of all 24 (n = 4) versions of the circuit in just 1 second. The block diagrams and the description of operation of all of these machines are given in the article. Orig. art. has: 6 figures.

ASSOCIATION: Institut problem peredachi informatsii AN SSSR, Moscow (Information transmission problems institute, AN SSSR)

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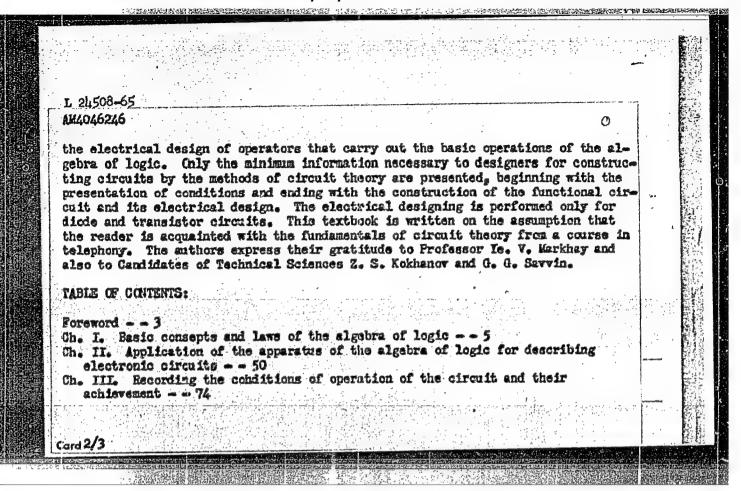
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"APPROVED FOR RELEASE: 03/13/2001

CIA-RDP86-00513R000928920007-4

ASD(a)=5/ESD(c)/ESD(dp) L 211508-65 BOOK EXPLOITATION A44046246 Ivanova, Ol'ga Nikolayevna; Lezarev, Vladimir Georgiyevich; Piyl', Yelena Ivanovne Synthesis of electronic circuits with discrete action (Sintez elektronny*kh skhem diskretnogo deyetviya) Noscow Ind-ro Svyaz, 1964. 175 p. illus., biblio. 6100 copies printed. Responsible editor: Ye. V. Markhay: Editor: E. M. Volkova: Technical editor: L. A. Trishina: Proofreader: F. A. Shtromberg TOPE TAGS: discrete action electronic circuit, algebra of logic, potential circuit, potential pulse circuit, diode circuit, transistor circuit, circuit theory, telephony, equipotential function, Boolean function PURPOSE AND COVERAGE: This book is intended for students and aspirants in communications institutes and for engineers working in the field of electronic discrete-action devices. Some methods of synthesizing the structures of electron-ic discrete-action devices are described. In this, certain concepts are given from the algebra of logic that are applied in the methods analyzed, as well as mathods of synthesizing potential and potential-pulse circuits and methods of Card 1/3



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ACCESSION NR: AP5012874 UR/0280/65/000/002/0035/0042

AUTHOR: Lazarev, V. G. (Moscow)

TITLE: Matrix method of minimization of microprogram flow charts

SOURCE: AN SSSR. Izvestiya. Tekhnicheskaya kibernetika, no. 2, 1965, 35-42

TOPIC TAGS: computer microprogram, digital computer

ABSTRACT: A new method is suggested for transforming and simplifying microprograms (used in digital computers, dial telephone systems, etc.) in which the
micro-operations are described by logical diagrams of algorithms (LDA); external
micro-operations of the microprograms are represented by LDA operators, and
internal micro-operations, by logical conditions (LC) of LDA. Thus, the rules of
transformation and simplification of LDA become applicable to microprograms:
the LDA's can be simplified by reducing the number of entrances of LC. If, however, an LDA has a number of entrances of the same operator, they are

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considered as different operators. In the author's LDA minimization method, the matrix diagram of algorithm corresponding to a specified LDA is interpreted as a matrix of states of an automaton which realizes this LDA. A nonrigorous equivalence between automata is tolerated which permits combining various operators (and LC's) into one complex operator (and LC); thus, various microoperations which can be performed simultaneously are combined into one microcommand. Orig. art. has: 12 formulas and 2 tables.

ASSOCIATION: none

SUBMITTED: 17Apr64

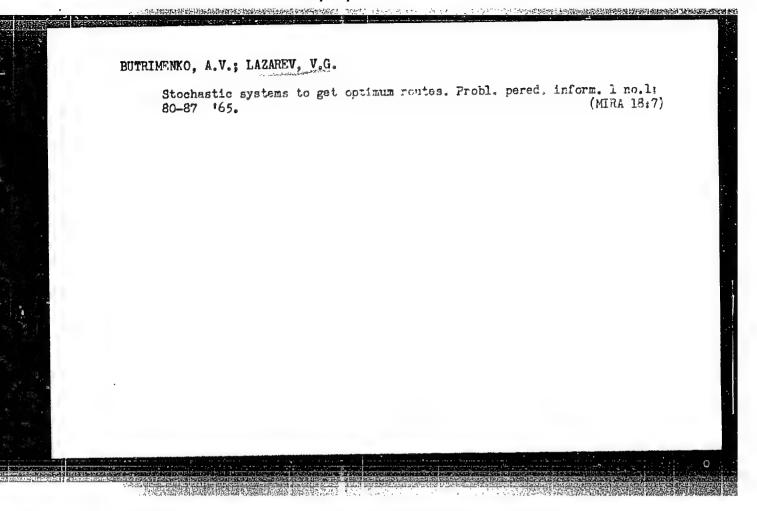
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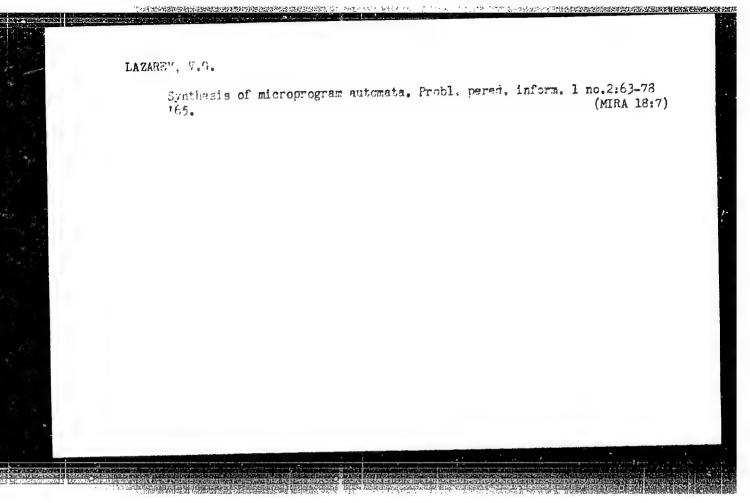
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L 8801-66 EWT(a) IJP(c) ACC NR: AP5026968 SOURCE CODE: UR/0103/65/026/010/1838/1844 29.55 AUTHOR: Lazarev, V. G. (Moscow) B ORG: None TITLE: A method for minimizing the logic circuit of an algorithm SOURCE: Avtomatika i telemekhanika. v. 26. no. 10. 1965. 1838-1844 TOPIC TAGS: logic circuit, algorithm, minimization, finite automaton, switching theory ABSTRACT: The author examines one of the possible interpretations of an algorithmic logic circuit in terms of a finite automaton in order to use methods for minimizing the number of states in the automaton to reduce the number of its elements to a minimum (both logical conditions and operators). It is shown that a minimized partial automaton may be constructed which simulates an algorithm for a logic element. It is proved that the number of internal states in this class of automatons is a minimum. A method is proposed for minimizing an algorithmic logic circuit based on reducing the number of entries of logic conditions when there are no iterative operators. This method may be extended to circuits containing identical operators where the number of entries of operators into the circuit is also minimized. Orig. art. has: 3 figures, 3 tables. SUB CODE: 09 / SUBM DATE: 05Aug64 / ORIG REF: 010 / OTH REF: 005 jw 1/1 UDC

ACC NR: AP6007533

SOURCE CODE: UR/0406/65/001/002/0063/0078

AUTHOR: Lazarev, V. G.

ORG: none

TITLE: The synthesis of microprogrammed automatons

SOURCE: Problemy peredachi informatsii, v. 1, no. 2, 1965, 63-78

TOPIC TAGS: automaton, algorithmic language, computer programming

ABSTRACT: The concept of the 2nd-order microprogram automaton (MA) is defined and a class of such automatons is determined, which includes such various forms of autonomous automatons as a central (programmed) control unit for a wide variety of control apparatus for information distribution systems, digital computer microprogram control units, etc. An autonomous MA (i.e., an automaton which can have only one input state R) is analyzed, with its working conditions described through the use of allogical algorithmic language, previously proposed as a programming tool. The nature and scope of the algorithmic language are defined, and it is shown how an algorithm for the abstract synthesis of an autonomous MA may be formulated on the basis of this language. State transition tables are analyzed for various versions of logical algorithm languages in order to illustrate the simplification of the language (i.e., the

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realization of an automaton with the least number of internal states) which is a necessary prior condition to the transition to a standard language defining the automaton. A matrix method, based on the compression of the automaton state matrix, is proposed, whereby it is possible to combine identical operators present in the different algorithmic languages. It is shown, on the one hand, that the employment of logical algorithm arrangements as the language used to define that specific class of automatons, referred to as microprogrammed automatons, provides a convenient and compact method of writing down the working conditions of these automatons, whereas the existence of formal techniques for the conversion and minimization of the arrangements permits the achievement of optimal solutions as early as in the first stage of automaton synthesis (the abstract synthesis stage). On the other hand, the interpretation of the logical algorithm arrangements as a finite automaton makes possible, in some cases, the effective use of automaton theory methods when converting the arrangements themselves, particularly when minimizing the microprograms. In conclusion, the author expresses his gratitude to O. P. Kuznetsov for advice and assistance. Orig. art. has: 5 formulas, 5 tables, and 8 figures.

SOURCE CODE: 09/ SUBM DATE: 25Jul64/ ORIG REF: 019

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"APPROVED FOR RELEASE: 03/13/2001

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L 05671-67 EWP(1)/EWT(d) IJP(c) GG/3B

ACC NR: AR6023253

SOURCE CODE: UR/0044/66/000/003/V077/V077

AUTHOR: Bukhgol'ts, N. V.; D'yachenko, V. F.; Lazarev, V. G.; Chernyshev, K. K.;

Sharov, V. A.

REF SOURCE: Sb. Vychisl. sistemy. Vyp. 18. Novosibirsk, 1965, 119-137

TITLE: On the problem of economy of a computer operating memory 16 C

SOURCE: Ref. zh. Matematika, Abs. 3V371

TOPIC TAGS: computer memory, computer programming, computer storage device

TRANSLATION: An application for computer storage of programs and constants used for the automatic control of a constant memory makes it possible to decrease the volume of the operating memory. The problem is solved without introducing changes in the program to find an image of the set of program variables in its field of operation such that the number of operating cells is a minimum. To construct this image, a space-time diagram is made up of traces of variables and their projections, making it possible to combine the addresses of different variables. Theorems are proved on the minimum number of addresses of variables in the program. A block diagram for the program of minimizing the number of memory cells is given. Offered as an example is a program for the computation of square roots requiring five operating cells. A programmer of average

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skill used 8 cells in systems of auto figures, 10 refere	. The method set forth here is applicable t matic programming, and in the design of spec nnces. Yu. M.	cialized computers. 6
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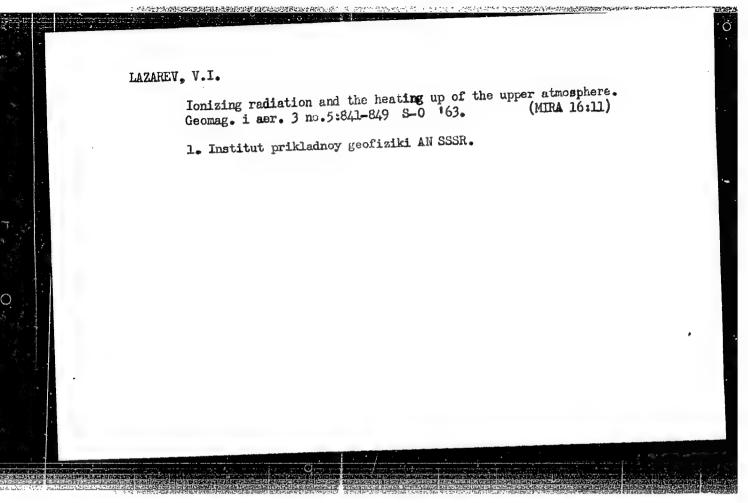
RABICHEVA, L.M.; SLONIMSKIY, B.I.; LAZAREV, V.I.; ALYUSHIN, Ye.I.; POIETAYEV, G.S.; Prinimali uchastiye: TARASOV, Ye.I.; AFONIN, P.I.; SYROVEGINA, K.V., nauchnyy sotrudnik Electrothermal method of obtaining zinc dust. Sbor. nauch.

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CIA-RDP86-00513R000928920007-4" APPROVED FOR RELEASE: 03/13/2001



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CIA-RDP86-00513R000928920007-4

OKOL'NICHNIKOV, Yu.D., arkhitektor; LAZAREV, V.I., agronom-ekonomist

Determining the size of rural settlements for the purpose of drawing up a scheme of district planning and designs for the drawing up a scheme of villages. Izv.ASIA 4 no.1:38-26 '62.

(MIRA 15:11)

(Rural planning)

LAZAREV, U.I.
6(5) PHASE

PHASE I BOOK EXPLOITATION

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Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut zvukozapisi

- Trudy...Vyp. 2. (Transactions of the All-Union Sound-recording Scientific Institute) Nr 2. Moscow, 1957. 164 p. Errata slip inserted. 1,000 copies printed.
- Editorial Board: L.P. Apollonova, V.S. Vaymboym, D.P. Vasilevskiy, A.A. Vroblevskiy, S.A. Gribkova, L.G. Grigorash, B.Ya. Kaznachey, V.I. Parkhomenko, L.A. Pusset, Ye.I. Regirer, M.A. Rozenblat; Tech. Ed.: S.A. Gribkova.
- PURPOSE: This collection of articles may be useful to scientists, engineers, specialists, and technicians dealing with sound-recording techniques.
- COVERAGE: The articles are the results of research carried out at VNAIZ in 1954-1955. Most of the articles deal with magnetic recording, both for the recording of sound as well as for fixing various physical processes on tape, wire, disc, or drum. References appear separately after each article.

 Card 1/7

SOV/1930 Transactions of the All-Union (Cont.) TABLE OF CONTENTS: 3 Foreword Eliasberg, I.I. The Present State and Possibilities of Improving Coated Magnetic Tapes The author surveys the present state of modern magnetic tapes with regard to their characteristics and requirements and discusses the possibilities of their improvement. Special attention is devoted to a description of coating powders. There are 21 references: 5 Soviet, 10 English, 4 French, and 2 German. Vaymboym, V.S. Ways of Increasing the Dynamic Range of a Sound-Reproduction Amplifier (Playback) for a High-fidelity 23 Magnetic Tape Recorder The author discusses the basic methods of increasing the dynamic range of playback amplifiers and explains diagrams, basic characteristics and results of investigation of an amplifier designed by himself. There are no references. Card 2/7

ansactions of the All-Union (Cont.)	SOV/1930
rkhomenko, V.I. Magnetic Playback Head The author explains the theory of magnetic modu a playback head based on the principle of frequ doubling. He illustrates the article by a desc equipment developed by VNAIZ for reproduction o at a lower speed of the tape mechanism. There references.	cription of of code pulses
sset, L.A. Investigation of the Reproduction Pr gnetic Sound Recording The article describes a theoretical investigati reproduction process of sound recorded on any m carrier. There are 2 references: 1 German, and	ion of the magnetic
zarev, V.I. Some Characteristics of Contactless coording of Sinusoidal Voltages The author reports the results of his experimentigation of contactless magnetic recording on a also explains the method he used to reduce the amplitude modulation of recorded pulses caused tricity of the drum side-wall. A description	ntal inves- a drum. He parasitic by the eccen-

Transactions of the All-Union (Cont.)

SOV/1930

MIZ-28 magnetic sound recorder. There are 2 references: 1 Soviet, and 1 English.

Kotlyarevskaya, L.G. Magnetic Discs
In connection with the NDD-54 dictaphone developed by VNAIZ, research and development work was carried out at the Institute on magnetic discs. The author discusses in detail the production of magnetic discs. She thanks Candidate of Technical Sciences P.M. Kozlov and Senior Scientific Worker N.A. Trifonova for their assistance. There are 14 references: 8 English, 3 German, 1 Polish, 1 Indian, and 1 Soviet.

Smirnov, V.S. The NDD-54 Disc-type Dictaphone
The article briefly describes the NDD-54 dictaphone (VNAIZ),
used for sound recording on magnetic discs. The author
lists the basic technical characteristics of this equipment.
There are no references.

Smirnov, V.S. A Contact Copying Machine for Mass-copy MKTM-1
Magnetic Tape Recorders
This magnetic tape-copying machine was developed by VNAIZ, and after a long period of production it was redesigned and modernized to secure a mass production of high-quality magnetic tape copies. There are no references.

Card 4/7

Transactions of the All-Union (Cont.)

SOV/1930

* TENTONICA SING SANDONS FASSINGS INCOMESSED IN

Gol'dberg, G.A., and S.V. Shul'gin. Magnetic Reverberation Chamber

93

The authors explain the basic methods of obtaining the reverberation effect by magnetic tape recording. They list the main characteristics of the reverberator designed and developed by VNAIZ, which is now successfully being employed in many organizations. At present the Institute is developing a new model of a remote controlled magnetic reverberator for lot production. There are 28 references: 12 English, 8 Soviet, 5 German, 2 French, and 1 Hungarian.

Langen, A.M., and M.A. Onatsevich. Investigation of External Electromagnetic Stray Fields Caused by Electric Motors in Sound Recording Equipment

122

The authors discuss special problems of design, selection, and application of electric motors of various types for sound recording equipment. They investigate the methods used for eliminating the effects of a-c electromagnetic stray fields. Materials concerning the effects of d-c electromagnetic stray fields will be published later. There are 4 Soviet references.

Card 5/7

Langen, A.M. On the Problem of Selecting the Type and Parameters of the Drive Motor for a Three-motor Broadcast Tape Recorder The author lists and discusses the requirements of the drive motor. His article is a continuation of the previous article. There are no references. Langen, A.M. Two-speed Synchronous Drive Motor for a Broadcast Tape Recorder The author provides technical specifications and recommendations on the selection of a two-speed motor. There are no references. Rezvyakova, Z.N. On the Audibility of Distortions of a Short Tone The author reports on the results of investigation of the audibility of nonlinear distortions caused chiefly by overmodulation in recording. She also discusses the effect of distortion level and its duration on audibility. There are 5 references: 2 Soviet, 2 German, and 1 English.	Transactions of the All-Union (Cont.)	SOV/1930
cast Tape Recorder The author provides technical specifications and recommendations on the selection of a two-speed motor. There are no references. Rezvyakova, Z.N. On the Audibility of Distortions of a Short Tone The author reports on the results of investigation of the audibility of nonlinear distortions caused chiefly by overmodulation in recording. She also discusses the effect of distortion level and its duration on audibility. There	meters of the Drive Motor for a Three-motor Broadcast Recorder The author lists and discusses the requirements of drive motor. His article is a continuation of the	the 131
Short Tone The author reports on the results of investigation of the audibility of nonlinear distortions caused chiefly by overmodulation in recording. She also discusses the effect of distortion level and its duration on audibility. There	cast Tape Recorder The author provides technical specifications and r tions on the selection of a two-speed motor. Ther	ecommenda-
	Short Tone The author reports on the results of investigation audibility of nonlinear distortions caused chiefly overmodulation in recording. She also discusses the second of the secon	n of the y by ne effect y. There

Transactions of the All-Union (Cont.)

SOV/1930

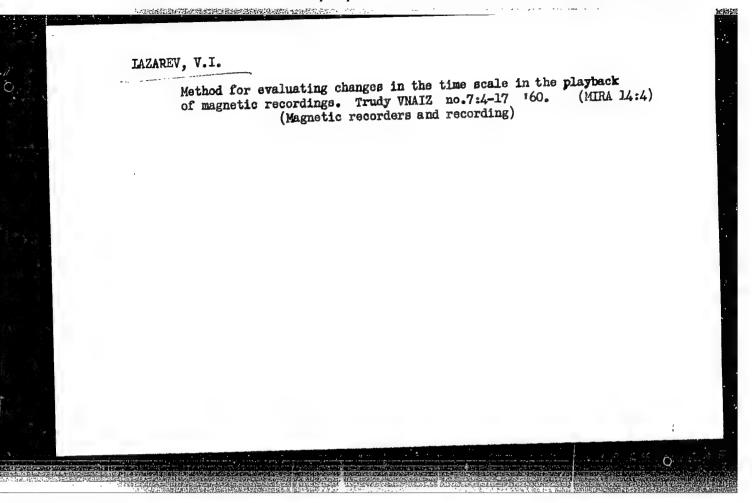
Simonov, I.D., and S.G. Korsunskiy. Call Signal Apparatus
The authors explain the operating principle and basic characteristics of a tuning-fork call-signal apparatus designed and developed by VNAIZ. They refer to a mechanical call-signal apparatus designed by V.T. Mal'tsev and discuss the advantages of the new apparatus, which is basically an automatic musical instrument. There are 6 references:

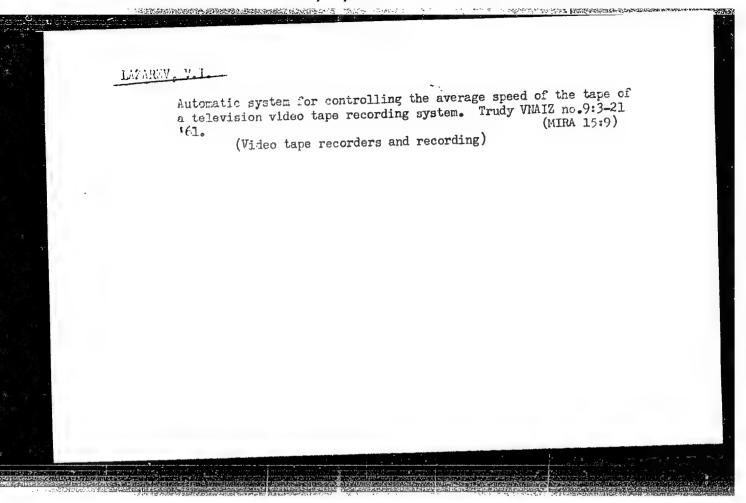
3 Soviet, 2 English, and 1 German.

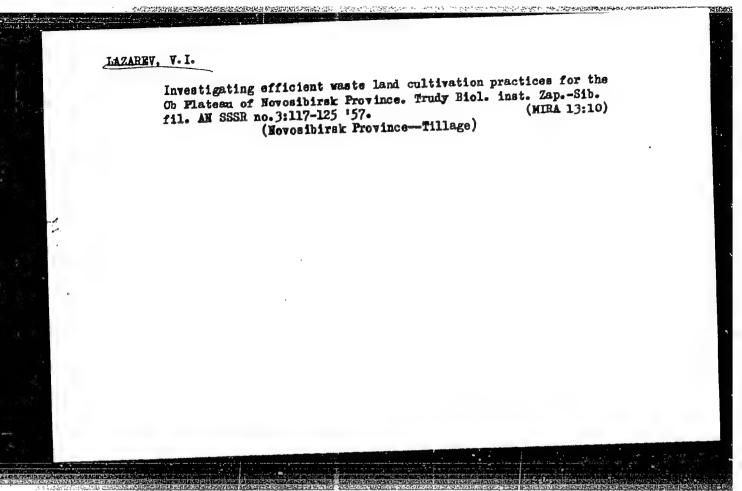
AVAILABLE: Library of Congress

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Card 7/7







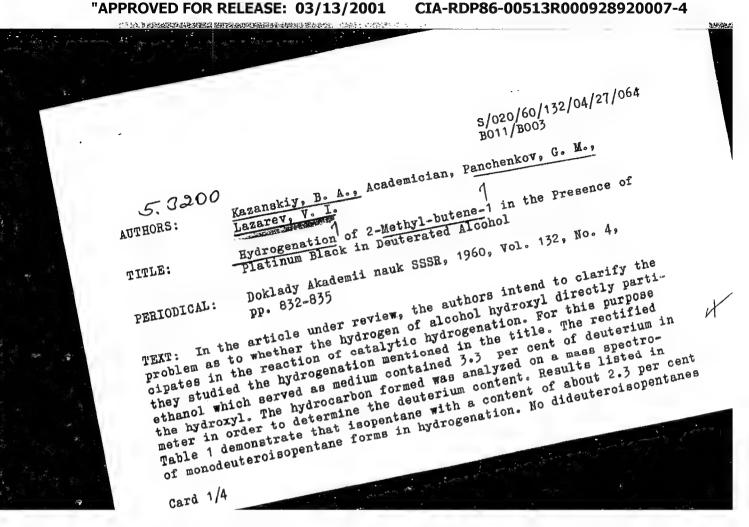
MONAKHOV, N.I., inzh., glavnyy red.; TURIANSKIY, M.A., inzh., zam. glavnogo red.; LAZAREV, V.I., inzh., red.; SHABSYUK, S.T., red.; KHAVIN, B.N., red.izd-va; RUDAKOVA, H.I., tekhn.red.

[Collection No.27 of consolidated cost indexes of water-supply and sewer structures and buildings to be used in the revaluation of capital assets] Sbornik no.27 ukrupnennykh pokazatelei stoimosti zdanii i sooruzhenii vneshnego vodosnabzheniia i kanslizatsii dlia pereotsenki osnovnykh fondov. Moskva, Gos.izd-vo lit-ry po stroit., arkhit. i stroit.materialam, 1959. 197 p. (MIRA 12:8)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroitel'stva. (Sewage)

(Water-supply engineering)

CIA-RDP86-00513R000928920007-4



Hydrogenation of 2-Methyl-butene-1 in the Presence of Platinum Black in Deuterated Alcohol S/020/60/132/04/27/064 B011/B003

were detected. In control experiment No. 15 isopentane was shaken with deuterated alcohol and platinum black at 20°C for 3 h 15 min in nitrogen atmosphere. No exchange of isotopes was found to occur. 2-methyl-butene-1 without hydrogen yielded 0.67 per cent of monodeuteroolefin in experiment No. 13. Hence, the exchange of hydrogen for deuterated alcohol on platinum attains equilibrium in the range of measuring accuracy. The yield of isotopic exchange (0.67 per cent) absolutely exceeds the portion of this exchange reaction in the total deuterium content of the hydrogenation product. The yield of isotopic exchange between the olefin uand the alcohol decreases in the course of reaction since the concentration of olefin drops constantly. The surface concentration of the olefin which was sorbed on the catalyst is also lower than in the control experiment, since hydrogen is sorbed on part of the active centers of the catalyst. The authors explain the formation of monodeuteroparaffin to the effect that hydrogenation and exchange take place independently of one another. In hydrogenation practically no exchange between olefin and alcohol occurs. The exchange of hydrogen for deuterated

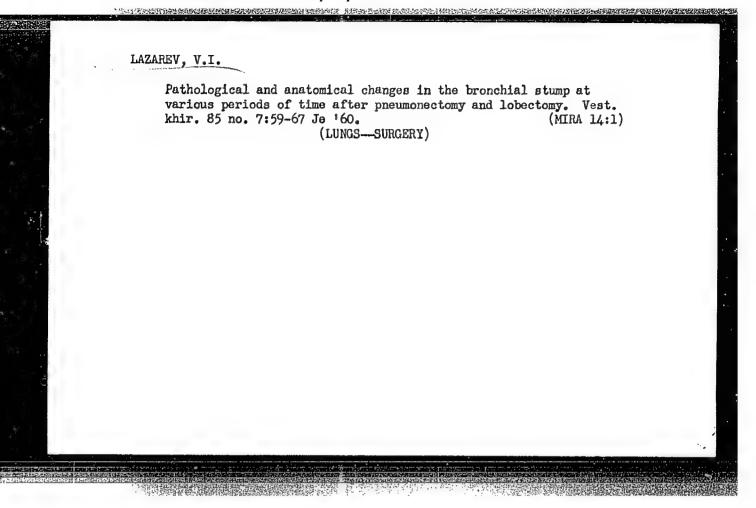
Card 2/4

Hydrogenation of 2-Methyl-butene-1 in the Presence of Platinum Black in Deuterated Alcohol

8/020/60/132/04/27/064 B011/B003

alcohol yields hydrogen with a content of 3.4 per cent of HD, whereas isopentane formed by hydrogenation contains only 2.3 per cent of monodeuteroisopentane. The authors explain this fact by the different rates of exchange reactions of C2H50D for H2 as well as by olefin hydrogenation on the surface of the catalyst. Hence it results that the hydroxyl hydrogen of the alcohol solvent does not directly participate in the reaction of hydrogenation. The hydroxyl hydrogen is exchanged for the hydrogen sorbed on the surface of the catalyst. If, however, an olefin is present in the system, it reacts with the sorbed H2 and HD in such a way that it is also sorbed on platinum. Thus, the two possible reactions of isotopic exchange between the olefin and hydrogen and the alcohol as well as the reaction of hydrogenation of the olefin have a limiting stage in common, i.e., the sorption of hydrogen on platinum. If all these processes take place simultaneously, the exchange reactions are retarded, whereas the exchange of the olefin for alcohol is completely surpressed. The authors thank L. N. Gorokhov, Z. V. Gryaznova, and I. V. Gostunskaya for their assistance. There are 2 tables and 17 references,

Card 3/4



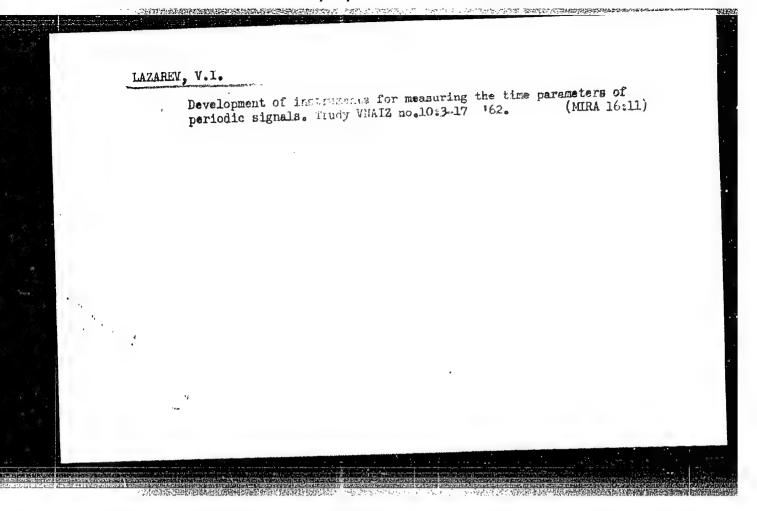
 RABIGHEVA, L.M.; LAZAREV, V.I.; ALYUSHIN, Ye.I.; POLETAYEV, G.S.;
Prinimali uchastiye: TARASOV Ye.I.; AFONIN, P.I.; SYROVEGINA,
K.V., nauchnyy sotrudnik; LEVIN, I.Kh., nauchnyy sotrudnik

Obtaining liquid zinc in the electric smelting process. Sbornauch. trud. Gintsvetmeta no.18:175-186 161. (MIRA 16:7)

1. Nachal'nik elektrotermicheskoy opytnoy ustanovki Belovskogo tsinkovogo zavoda (for Tarasov). 2. Starshiy master elektrotermicheskoy opytnoy ustanovki Belovskogo tsinkovogo zavoda (for Afonin).
3. Gosudarstvennyy nauchno-issledovatel'skiy institut tsvetnykh metallov (for Syrovegina, Levin).

(Zinc—Electrometallurgy)

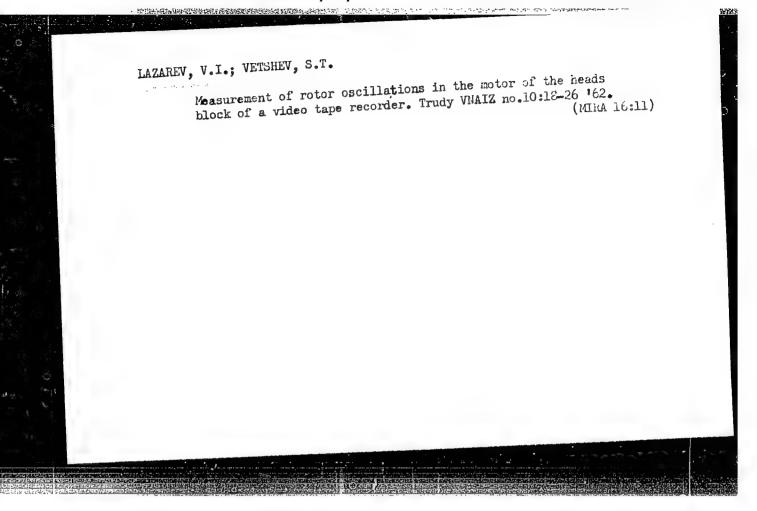
Zinc—Electrometallurg (Liquid metals)

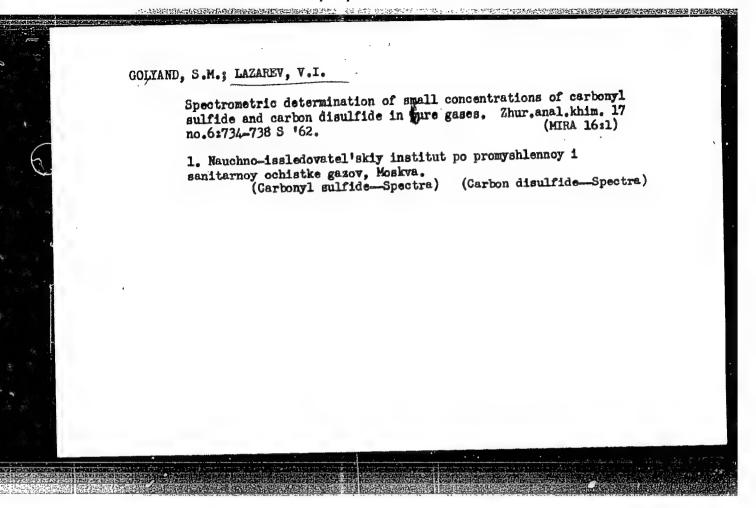


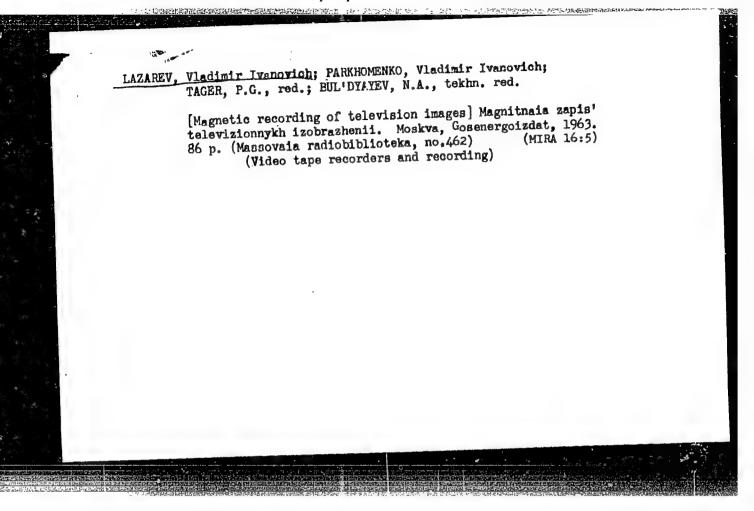
GOLYAND, S.M.; KRAPIVINA, T.K.; IAZAREV, V.I.

Isotopic exchange of hydrogen sulfide with the products of its sorption on catalytic and activated carbon. Zhur. fiz. khim. 36 no.6s1320-132L Je⁶62 (MIRA 17s?)

1. Gosuda: tvennyy nauchno-isoledovatel skiy inatitut po promyshlenn y sanitarnoy ochistke gazov.







S/187/63/000/002/003/004 A004/A126

AUTHOR:

Lazarev, V. I.

TITLE:

Automatic control system of the film and head motion speed in

video magnetic sound recorders

PERIODICAL: Tekhnika kino i televideniya, no. 2, 1963, 37 - 41

TE.T: The author analyzes the purpose of the automatic system for controlling the film and head motion in video magnetic sound recorders with transverse line recording. He describes the block diagram of the system and its basic structural elements, viz. phase discriminator and controllable oscillator. The driving motor of the film stretching mechanism operates without control during recording. The control system maintains a constant ratio of phases between the revolution frequency of the motor to the signal base frequency, so that the instantaneous frequency of the motor to the signal base frequency, so that the instantaneous angular position of the rotor and, consequently, that of the revolving heads is angular position of the phase base signal and does not vary. The phase discriminator consists of a trigger system with two stable states. The oscillator cirminator consists of a trigger system with two stable states characteristics remain cuit parameters are selected in such a way that its static characteristics remain

Card 1/2

Automatic control system of the film and...

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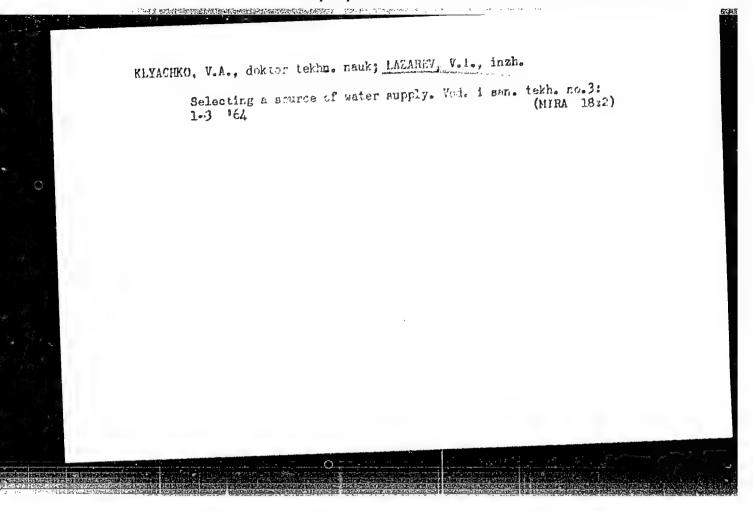
linear over all sections of possible signal variations by time errors, while its mean frequency amounts to 50 cps. The connection of the phase discriminator to the oscillator does not cause any deterioration, but, on the contrary, somewhat improves the stability of the control system as a whole. The described control system is used in the "Kadr" video magnetic sound recorder. There are 4 figures.

Card 2/2

AICHIA, Ye.P.; LAZAREV, V.1.

Sorption of thoron with activated carbon. Enuc. prikl. khim. 37 no.11.2518-2521 N MA (MHR 1821)

1. Gosuda-tivannyy nauchnc-icsiciovateliskiy institut po promychlernoy i sanlternoy cenistks gazov.



L 12926-66 EWT(m)/EWA(d)/EWP(t)/EWP(z)/EWP(b) JD
ACC NR: AP6000180

SOURCE CODE: UR/0032/65/031/012/1437/1438

AUTHOR: Lazareva, V. I.; Lazarev, A. I.

ORG: Novomoskovskiy Affiliate, State Scientific Research and Design Institute of the Nitrogen Industry and Organic Synthesis (Novomoskovskiy filial Gosudarstvennogo nauch-ganicheskogo i proyektnogo instituta azotnoy promyshlennosti i produktov or-

TITLE: Extraction of photometric determination of bismuth in cast iron

SOURCE: Zavodskaya laboratoriya, v. 31, no. 12, 1965, 1437-1438

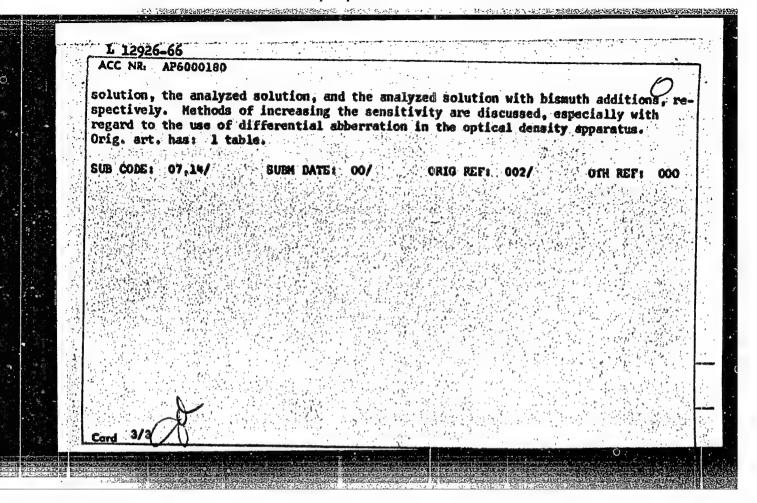
TOPIC TAGS: photometric analysis, microchemical analysis, bismuth, cast iron

ABSTRACT: The feasibility of the iodide method of determining trace quantities of bismuth in cast iron is investigated. Ascorbic acid, thiocarbamide, potassium iodide, and citric acid were added to a solution of cast iron. The bismuth complex was extracted by ethyl- or amylacetate. Bismuth was separated from the extract by means of a citric acid solution of pH = 9. The final bismuth content was determined after restraction by the iodide method; the sensitivity of the method was as high as 5·10⁻⁴⁴ from 1 g suspensions. Tabular data were given as follows:

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Card 1/3

ACC NR: AP600		muth content in cast	iron
ided Bi,	Found Bi		% Error
icrograms	micrograms	10-38	a griot.
do ma	23; 24; 25	2.4	
18	43; 45; 47	4.5	+7
-	18	1.8	T /
18	40	4.0	+11
	7	0.7	
18	27	2.7	+8
tue filter (λ_{ej}) is muth analysis	ff - 433 millimicrons) 3 was based on the for	ical density was measin a 50 mm cuvette, mula	and compared to water. The
iere a in Gnaill	or added bromdell,	z and by are	optical densities of dummy



LAZAREV, V.I.; MOISEYEV, Yu.V.; GOLYAND, S.M. (Moseow)

Hydrolysis of carbon disulfide in alkali solutions. Zhur, fiz.

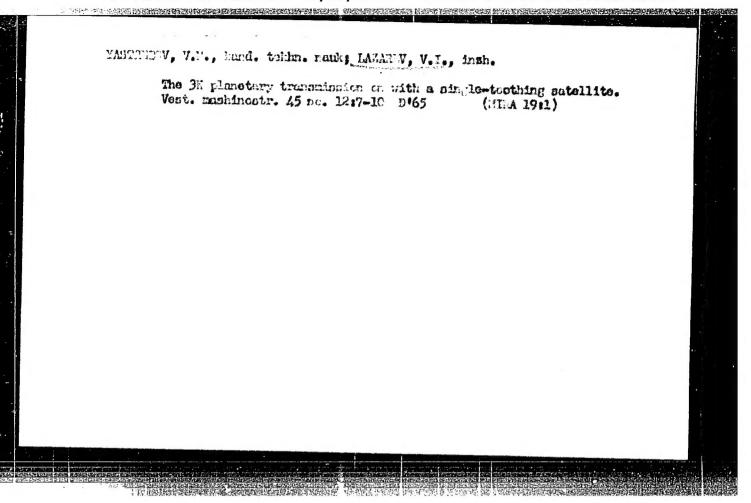
Hydrolysis of carbon disulfide in alkali solutions. Znur. fiz. khim. 39 no.2:376-380 F '65. (MIRA 18:4)

1. Institut khimicheskoy fiziki AN SSSR i Gosudarstvennyy nauchnoissledovatel'skiy institut po promyshlennoy i sanitarnoy ochistke gazov.

LAZAREV, V.I.; MOISEYEV, Yu.V.

Hydrolysis of carbon disulfide in alkali solutions. Znur. fiz. khim. 39 no.2:445-447 F '65. (MIRA 18:4)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut po promyshlenncy i sanitarnoy ochistke gazov i Institut khimicheskoy fiziki AN SSSR.



BAZILEVICH, S.V. HANTUKHOV, G.V., inzhener; LAZAREV, V.L.;	
Methods of improving blast furnace process indices. Stal' 16 no.12:1061-1067 D '56. (MLRA 10:9)	
1. Hovo-Tagil'skiy metallurgicheskiy zavod. (Blast furnaces)	
(-1350 1 m naces)	